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(Upper case)  
⑥ OPERATION CROSSROADS,  
Chronological History of the activities of

The Director of Ship Material

Joint Task Force One

aboard the U.S.S. RECLAIMER (AF342)

during Test Baker,

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NOTE: The following pages are a chronological history  
of the special activities of the Director of Ship  
Material from 24 July 1946 through 31 July 1946,  
while in U.S.S. RECLAIMER.

⑦ Rept. for 24-31 Jul 46.

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Classification (Cancelled) to **UNCLASSIFIED**  
By Authority of *Memorandum* Date *3/2/65*  
By *Refina*

APPROVED:

Reg. No. 57

T. A. Solberg,  
Rear Admiral, U.S.N.

⑪ 31 Jul 46,

⑫ 17p.

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The Director of Ship Material, Rear Admiral T.A. Solberg, U.S. Navy, and a few members of his staff, boarded the U.S.S. RECLAIMER (ARS-42) at 1200, Wednesday, 24 July 1946. The RECLAIMER, as a part of the salvage force, T.U. 1.2.7, stood out of the lagoon about 1300 that afternoon. During that night, T.U. 1.2.7 kept formation outside Bikini lagoon. At 0800, Thursday, 25 July, T.U. 1.2.7 lay in a formation of two columns to the southward of Enyu Island, outside the lagoon. At 0835, the fifth atomic bomb was detonated underwater in Bikini lagoon. This was the second atomic explosion held in Bikini lagoon, known as Test BAKER of Operation Crossroads. **QUALIFIED REQUESTERS MAY OBTAIN COPIES OF THIS REPORT FROM DQ NOT FOR PUBLIC RELEASE.**

At 0835, (How hour), the instant of explosion, a medium red but not intense flash about 150 feet in height, slightly domeshaped, about 1,000 feet in diameter was observed from the RECLAIMER. Simultaneously, a plume or jet of water rose vertically and an expanding cloud of vapor and water moved outward. This cloud appeared to be about 100 feet high and gradually enveloped all but the outer ships in the array. The expanding low cloud mentioned above had the appearance somewhat of a huge breaking wave. The following comments on the explosion are from observations as noted by Dr. Louis A. Hempelmann of the Radiological Safety Section:- "At How hour, a jet of water was observed to rise rapidly from the target area. I am not conscious of a flash but



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I must have blinked since others on the ship reported a flash associated with the plume of water. The plume of water rose above the lowest layer of natural clouds, estimated to be about 5,000 feet above the water. Shortly after this, the plume was obscured by a canopy which had the shape of a hemisphere and which had the appearance of ground glass. Before the plume was obscured it is estimated that its diameter was about 1/6 of the width of the target array from this position. The canopy had a diameter about four times this. The canopy lasted only a short time, presumably several seconds. It was then obscured by what appeared to be a white cloud which rolled outward from the edges of the canopy, and extended almost the complete width of the target array. The fog extended almost to the lower level of the clouds. This fog gradually disappeared in the course of about 20 minutes, during which time increasing numbers of ships became visible through the haze. Above the lower level of natural clouds, a white cloud was observed to form in a course of several minutes after the explosion. This was never as dense as the top cloud formed by test ABLE. It was noticeable as a distinct cloud for about 30 to 40 minutes. Approximately 70 seconds after the explosion a faint blast was felt primarily as pressure in the ears. No water blast was noticeable. The top of the cloud formed by the water seemed to have an elevation between 5 to 10 degrees above

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the waterline of the horizon".

At 0843, it appeared that the SARATOGA had lost her stack. Outer ships in the array were visible. Soon after the flash it appeared that one of the outer ships in the northwest part of the array was afire but at 0842, was unable to distinguish any fire. Some observers reported seeing a fragment hurtle out from the upward rushing column of water. This fragment, evidently a part of one of the target vessels, was seen to be trailing a column of smoke as it was thrown outward and downward from the vast up-flung column of water. By 0847 the target area had cleared considerably. There was no sign of the ARKANSAS or the concrete barge YO 160 being afloat. By 0849, what might have been a wave from the blast appeared to be breaking on the southern shore tip of Enyu Island. Since waves do not usually come in to any extent from this direction, it was presumed that this wave was from the blast. At 0918 the RECLAIMER started maneuvering going from 10 to 12 miles out. Observations were obscured by the FALL RIVER and other ships.

At 1330 the RECLAIMER was inside the lagoon south of the target array. The HUGHES had about a two degree list to starboard, down about one foot at the stern. The seaplane on the NEW YORK is blown from its securing with the port wing in the air and apparently broken. Viewing the SARATOGA from the

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stern, with the RECLAIMER in a position near LCI 327, the SARATOGA listed to starboard about 5 degrees. Her foretopmast bent over to port 105 degrees, stack blown over to port and lying on deck. What appeared to be the stern buoy has been driven up along the starboard counter. At about 1405 the RECLAIMER passed the red line and turned to port to get into clear water. The gun tubs of the SARATOGA just forward of the stern buoy under the starboard counter are apparently intact, as is the flight deck. Where the uptakes were joined on the structure, the uptakes broke off just below the level of the flight deck and are apparently in one piece but lying across the flight deck. Her draft is slowly increasing with the list remaining about the same. Her flight deck is about 10 feet from the water. At 1500 the lip of the center hawse pipe forward on the SARATOGA is now about three feet from the surface of the water and she is settling by the stern. At 1550 the forward center hawse pipe is covered by water. She is going down by the stern, with the list to starboard increasing. At 1557 the fantail is going under and spouting geysers of water as the bow rises at first very rapidly, and then more slowly, as the SARATOGA sinks stern first. As she sinks, she rights herself and apparently sinks to the bottom in an upright position. At 1608, the bow went under, but the top of her radar mast did not disappear.

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under the waters of the lagoon until 1813. At the time of sinking the RECLAIMER was about 1200 yards distant and the only operating vessel in this vicinity. Other vessels of T.U. 1.2.7 had been ordered to their anchorages because of the impossibility of operating in the radioactive waters in the target array. As the RECLAIMER steamed to her anchorage it was noted that the U.S.S. FALLON's forward wellin davit strongback was missing and the after one dislocated: the port foremast boom had been jarred from its vertical housed position and had fallen to the deck level to starboard. Four attempts were made from different directions to approach the FALLON, HUGHES and SARATOGA with the object of cutting their moorings and towing them to the beach. Each time however water was entered having tolerance times of about ten minutes and each attempt was abandoned.

It is apparent from observations in the center of the array that there was considerable blast effect and shock effect from the blast, whether or not it was the result of actual air blast or the effect of large volumes of water hitting the nearby ships is not clearly evident. As a result, ships outside of the 1,000 yard circle appeared to be strongly radioactive and difficulties will be encountered in clearing them so that they can be reoccupied by crews. A significant indication of the blast effect is the fact that one large buoy from the LCT 1114 has been blown into the superstructure of the NAGATO. The HUGHES also indicated the effect of blast and shock because of the fact that two of her torpedoes had been partially

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hooked out of their tubes. No significant effects of blast or water and wave damage have been apparent so far outside the 1,000 yard circle and in some cases closer in. For instance, in the case of the PENSACOLA, about the distance from which she has been viewed, there has been no additional significant damage from blast effect than that obtained on ABLE day. The HAGATO has about a two degree list to starboard which may be increasing slightly. However, this may be due to normal slow leakage which has been experienced in this vessel since her arrival in the area. Conditions of submarines have not been determined definitely but it appears from air and surface observation that the TUNA is in normal condition. Buoys of others are showing and no positive indication of their condition can be determined, but it appears that some are not in the normal position existing prior to the test.

On Friday, 26 July, the RECLAIMER got underway in the morning to attempt a tour of the target array for draft measurements and Geiger readings. In the afternoon operations were started for towing the U.S.S. HUGHES (DD110) to the beaching area. The HUGHES then had only one foot freeboard with no list. At 1505 four men were placed aboard the HUGHES on the forecastle to cut the anchor chains and secure the tow line. The RECLAIMER got underway with the HUGHES in tow at 1512 but the tow line proved too small and broke two minutes later. A larger cable was then secured to the forecastle of the HUGHES and at 1521 the RECLAIMER was underway at a slow speed with the HUGHES in tow. At 1733 the tow line was released and the HUGHES allowed to drift toward

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the north end of Enyu Island. The RECLAIMER, on the aft port quarter of the HUGHES, assisted by an LCM on the aft starboard quarter, pushed the HUGHES toward the beach. The tow was turned over to the ATR 40 of T. U. 1.2.7, which, assisted by the LCM stationed directly astern of the HUGHES succeeded in beaching the destroyer at 1752.

On Baker day plus two, Saturday, 27 July, the RECLAIMER got underway early in the morning for purposes as heretofore of obtaining general situation of vessels and drafts and Geiger readings of the vessels of the target array proper. At 0952 the RECLAIMER approached the U.S.S. FALLON (APA81) to commence towing operations for beaching. The FALLON was down eight feet by the stern according to draft marks on the starboard side aft. The port forward boom was dislodged and carried over to the starboard side. No great amount of blast effect was apparent but considerable shifting of equipment on deck to the starboard side was noted. Radioactive readings off the side of the FALLON indicated one hours tolerance. Because of this high tolerance off the ship, towing and beaching operations were delayed. The RECLAIMER continued her tour of the target array and the following notes were taken. The after stack of the U. S. S. DAWSON seemed somewhat collapsed and the port after well davit partially carried away. Time tolerances as noted on various target ships were all low with a few of the readings as taken from the RECLAIMER, all of which were taken from 10 to

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100 feet away from the ships, noted herein. Tolerance amidships on the PENNSYLVANIA two hours, aft, 30 minutes, at No. 3 turret 30 minutes, 25' aft of the fantail, one hour. Three hour tolerance off fantail of the U.S.S. NEW YORK. Two and one-half tolerance hours 100 feet off the port side of the NAGATO and one and one-half hours tolerance off the starboard side. One hundred feet off the NEVADA's sides it was found that the tolerance was two and one-half hours which decreased to 45 minutes at the stern. The GASCONADE showed considerable evidence of blast damage particularly amidships. The plane on the starboard quarter appeared badly banged up, being off its foundation with one wing badly smashed. The starboard gangway had been blown inboard. The after port quarter also showed effects of blast damage with chairs and other equipment strewn around. The port boom had been blown out of its housing but was still held by the topping guy. Both stacks were slightly indented on the after edges. The LCT 816 was down by the stern with the deck awash. She was alongside the LST 133, anchor and buoy apparently having been displaced. The canvas around the bridge was torn away. The NAGATO had broken her stern mooring and was riding about 150 feet from the bow of the NEVADA with a list of about 8 degrees to starboard. Ports on both the starboard and port sides were somewhat bashed in.

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The Director of Ship Material requested a conference with CJTF 1, Colonel Warren and other scientists to discuss ways and means of decontaminating the large number of highly radioactive ships in the target array. Colonel Warren held this conference at 1900 aboard the U.S.S. HAVEN. The Director of Ship Material had earlier tried washing down the U.S.S. HUGHES but no definite readings or results had been obtained although there was some indication the activity was reduced. The Director of Ship Material proposed going ahead with decontamination using such materials as were available and stated that the HUGHES would be sprayed with foamite the following day and subsequently washed down with salt water. Dr. Overstreet agreed to run certain laboratory tests to determine what chemicals would assist in decontamination. The Director of Ship Material stated that he believed from his observations close aboard many target vessels, that the radiological conditions would prevent boarding for any purposes for more than short periods unless positive steps were taken to reduce radioactivity. The Director of Ship Material proposed continuing use of foamite on a temporary basis and meanwhile going ahead with trials of boiler compound, lye and starch mixtures, which it was believed would have noticeable effect because of its paint removal action.

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On BAKER day plus three, Sunday, 28 August 1943, the RECLAIMER again got underway for a tour of the target array. During the day the radiological safety section was handicapped by a lack of radiological survey and for this reason the Director of Ship Material used the RECLAIMER to make two extensive sweeps through the array, the morning sweep covering the eastern half of the array, going well in towards Bikini. On this sweep the LCT 1111 was definitely located 300 yards north of the MUGFORD floating with bottom up and with four feet freeboard aft. The bottom showed no damage whatever. Water readings obtained were furnished to Rad Safe. On the afternoon sweep the western half of the array was covered and ships in the array were approached closely in order to get some indication as to which ships might be boarded by boarding teams the following day. As a result it appeared that the CONNINGHAM, WALTWRIGHT, MUGFORD and CARTERET might be safe to board. Captain Uehlinger, head of the Bureau of Ordnance Instrumentation Group, called to request boarding of certain vessels to recover underwater instruments and arrangements were made for this. At 2000 Colonel Warren had a conference to discuss the possibility of instrumentation parties boarding various ships. It was apparent that all people involved in instrumentation have only one object in view and that is to recover and

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examine instruments and to this end they are willing to overstep the bounds of the safety plan and apparently have no fear or conception of the dangers involved. It was decided that one motor launch might be used by Commander Gerlach for picking up certain light-weight instruments. A message was sent to CJF 1 that transports carrying the crews of three APA's be returned to the harbor and regular boarding procedures carried out and these vessels moved to anchorages at which technical and instrumentation teams could carry out their functions and ships subsequently be sailed from Bikini. This was approved but only the Bayfield carrying the Fillmore and Niagara crews was ordered in. Request was also made that the transports carrying submarine crews be ordered in so that they could be available. Plans were made for using Initial Boarding Teams #3, #4, and #7 for 29 August 1946 for decontamination procedures on the HUGHES, DENTUDA, LCI's and LCT's. Also arranged with T.U. 1.2.7 to move the PARCHE, SKATE and all other submarines as soon as they were raised, into shallower water which was not contaminated. The TUNA has been moved in this date. This will facilitate decontamination, opening up, and reboarding operations as well as putting the submarines in a safer location and condition in case any damage has been received. Commander Harris of the Radiological Safety

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Section was on board to observe operations and assist in correlating radiological readings obtained from the water for use of RadSafe. Draft and Geiger readings were taken both on the morning and afternoon sweeps, along with a few notes of blast damage. Of the blast damage noted, the following was most noteworthy. The LCT 1114 as mentioned above, was discovered about 300 yards north of the MUGFORD bottom side up. The bow ramp was still closed, and the bottom and sides of the ship appeared normal. Her number was clearly visible under water. The doors on both PBY's port side appear to have been blown in. The waters in this vicinity were radiologically "hot" and it was impossible at this time to approach too closely.

The RECLAIMER got underway at 0855 on BAKER day plus four, Monday, 29 July, for her usual trip of inspection through the target array. Captain G.M. Lyons and Dr. Nolan of the Radiological Safety Section boarded the RECLAIMER in order to observe operations and assist in studies of decontamination which were in progress. It was decided to go along the quarterdeck of the NEW YORK and have Dr. Hempelmann obtain readings at four or five spot locations on the stern of the ship. This was done and Dr. Hempelmann was put aboard the NEW YORK at 1058. After being aboard the NEW YORK for a period of three minutes, Dr.

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Hempelmann returned aboard the RECLAIMER and reported that there was about a twenty minute tolerance aboard the NEW YORK. In the short time he was aboard the NEW YORK, Dr. Hempelmann received one-fourth of a daily dosage. Subsequently the NEW YORK was given a thorough hosing from stern to stern including superstructure for a period of about two hours concentrating the last half hour on the quarterdeck where the readings were taken previously. About 1700 Dr. Hempelmann was again put aboard the NEW YORK in order to get a check on readings to determine results obtained. It was found that the tolerance time had been increased to forty minutes tolerance. This demonstrated that even plain forceful washing had considerable effect. It was decided to give the HUGHES another foamite treatment and also the DENTUDA, allowing them to dry five or six hours and subsequently hosing off. A heavy coat of foamite was applied to the DENTUDA but due to shortness of time only an incomplete hosing down could be given. A slight reduction of radioactivity was noted and a further washing will be given tomorrow. The HUGHES was thoroughly coated with foamite which was allowed to set for several hours. A complete survey of radiological conditions was made prior to application of foam. The foam was then washed off and radiological survey repeated. A marked improvement was noted with an

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average reduction of activity of about fifty percent where the washing was thorough. The maximum reading, port side, after washing was 3.0 R/24 hours. The maximum reading, starboard side, was 3.5 R/24 hours. The average for the ship being about 2.0 R/24 hours.

The LCI 327 was thoroughly washed down with no change in readings noted. The LCT 318 was also thoroughly washed down and no changes were noted in readings. The CONYNGHAM was boarded and found to be rather mildly radioactive while the Wainwright was more so and the MUGFORD still higher. The CONYNGHAM and MUGFORD were given a limited hosing and the readings subsequently are as follows: CONYNGHAM before hosing: maximum reading on Mk. 33 Director 2.0 average reading on main deck 1.0 R/24 hours. After a vigorous hosing the Geiger readings obtained indicated a drop, reading as follows: Mk. 33 Director 1.5 R/24 and on main deck 0.7 R/24 hours. The readings diminished in general about 1/3. The MUGFORD was also given a hosing down with readings of 20.0 R/24 hours before hosing and after an incomplete survey readings after hosing indicated 4.0 to 14.0 R/24. As on previous days the staff of the Director of Ship Material aboard the RECLAIMER took draft readings and obtained Geiger readings from radiological monitors for notation besides noting effects of blast damage on various

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target vessels. The GASCONADE appeared to have about a one degree list to port, while the Army radar antenna was knocked over to port. The NAGATO appears to have taken a somewhat greater list with the main deck awash periodically from frame 120 to frame 140. It was noted that the NIAGARA was the first target ship of the array to hoist colors with crew having boarded this date. The NIAGARA, BLADEN and GENEVA were boarded by Director of Ship Material.

On BAKER day plus five, Tuesday, 30 July, the RECLAIMER got underway for a trip to the North end of Enyu Island where the morning was spent in observing the operation of hosing down of the BLUNTUDA. An afternoon trip through the target array was made for the purpose of checking drafts of various target ships, especially those in immediate danger from progressive flooding. It was noted that the PENSACOLA had about a three and one half degree list to starboard. Observed the foaming down and hosing off after foaming of the NEW YORK and then returned to anchorage.

The Director of Ship Material and officers from the radiological Safety Section on BAKER day plus six, Wednesday, 31 July, made a boarding of the CONYNGHAM WAINWRIGHT and MUGFORD to obtain radiological readings and to make a cursory inspection of damage. It was believed by Radiat that portions of crews could be put on

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board for certain lengths of time for purposes of carrying out local intensive decontamination work. The WARWRIGHT and MUGFORD had about three to four feet accumulated leakage in the engine room bilges.

For other work done on decontamination see enclosure (j) to Director of Ship Material Final Report.

During the period up to 8 August the Director of Ship Material carried out operations and duties from both the U.S.S. RECLAIMER and U.S.S. WHARTON. The remainder of this history can be found in Director of Ship Material History, enclosure (L) to Director of Ship Material Final Report.

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